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Studies on Streptococcus agalactiae Infection

V.—Bacteriological Diagnosis

By

JOHN FRANCIS, B.SC., M.R.C.V.S.

Imperial Chemical Industries, Ltd., Biological Laboratories
Wilmslow, Cheshire

The control of all infectious diseases, which cannot be diagnosed clinically, has depended on the development of diagnostic methods sufficiently simple to be applied on a very large scale. Work describing the way in which chemotherapeutic procedures may assist the eradication of *Str. agalactiae* infection has been described elsewhere (Francis, 1948), but it is probably still true that the effective control of mastitis associated with *Str. agalactiae* depends largely on the development of bacteriological methods sufficiently simple to make wide-scale diagnostic work less onerous.

Numerous attempts have been made to develop a simple test detecting some changed property of the milk, for the "indirect" diagnosis of mastitis. Light infections with *Str. agalactiae* often produce little or no change in the milk for considerable periods, so if we wish to detect all infections with *Str. agalactiae* these methods are obviously doomed to failure (for a description of these and other diagnostic tests see Little & Plastridge, 1946).

Most of the early workers on the control of infection with *Str. agalactiae* inoculated a given, relatively small, quantity of milk from quarters into deep blood-agar plates. More recently it has been realised by numerous workers that this is not a very sensitive test. Mattick *et al.* (1941) showed that in some herds in which 70 per cent. or more of samples were positive after incubation of the milk sample only about 5 per cent. were positive by direct plating. These are bigger differences than are often obtained, but when receiving laboratory reports it is obviously important to know what technique has been used. In our earlier work on the control of infection in herds the following technique was adopted:—

Each sample was plated on half a blood-agar plate with a loop delivering 1/100 ml. of milk (not gravity cream). Samples were then incubated and again streaked out on a blood-agar plate. Results were recorded in the following way:—

4—Numerous organisms on the first plate.
3—Moderate number of organisms on the first plate.
2—A few organisms on the first plate.
1—Organisms only on plate inoculated with the incubated sample.

This technique is less laborious than the earlier plating techniques; it gives an indication of the severity of infection and will detect very small numbers of organisms.

The Significance of Positive Findings in Incubated Milk Samples

Some workers, and particularly Cunningham *et al.* (1946 and 1947), have doubted whether the finding of *Str. agalactiae* only after incubation of the sample indicates "infection" of the quarter. They have shown that, when the ends of the teats are washed more carefully and other precautions are taken, the proportion of samples positive only after incubation is reduced, and have concluded that many of these incubated positive samples represent "contamination." Much depends on the definition of terms, but it is well known that in, say, the detection of salmonella infection or of carriers of various throat pathogens, the more searching and more frequent the bacteriological technique, the more positive results are obtained. In the diagnosis of tuberculosis by the examination of sputum it is also recognised that samples may be negative for considerable periods, although the lung is infected. The number of negative samples is reduced as diagnostic methods are made more sensitive, and the same is doubtless true of mastitis. It is admitted that samples positive only after incubation may merely indicate colonisation of the teat canal, but in work on the control of infection it is important to recognise such teats.

Table I

Comparison of Results obtained by Direct Plating and Plating Following Incubation of the Sample,[1] Together with Data on *Str. Agalactiae* Infection of the Udder

Herd[4] number	Number of quarters	Infection: Number isolations: By direct plating	Infection: Number isolations: By plating after incubation of sample	Number of quarters positive only on one or two occasions in incubated samples: Quarters	Number of quarters positive only on one or two occasions in incubated samples: Total number positive incubated samples	Number of positive incubated samples associated with two other similar isolations or a positive result by direct plating: Quarters	Number of positive incubated samples associated with two other similar isolations or a positive result by direct plating: Total number positive incubated samples
1	44 (28)	99	51	13[2]	16	15	35
2	60 (28)	110	39	15[3]	17	13	22
Total	104 (56)	209	90	28	33	28	57

[1] See footnote, Table II, for explanation of technique.
[2] Two treated at time of negative examination.
[3] Ten treated at time of negative examination.
[4] See Francis (1948) for a fuller description of events in these herds.

Our own observations in two herds provide data on the significance of the two methods. Table I shows that *Str. agalactiae* was isolated 209 times by direct plating, and an additional 90 times following incubation of the sample, from 104 quarters. Of these 90 isolations 33 were from quarters in which they were the only isolation or there was only one other similar isolation. Fifty-seven of these isolations were associated with at least two other similar isolations or an isolation by direct plating. These results are even more significant when one realises that on 12 occasions when two or less isolations were obtained in incubated samples from one quarter, the quarter was treated at the time a negative sample was taken, so the chances of further isolations were much reduced. It would seem, therefore, that in at least 57 out of 90 occasions, a positive result after incubation of the sample was of real significance. In addition, it is often noted that a quarter may at first be positive only after incubation and then become more heavily infected. An infected quarter of Cow 16 was examined 20 times over a period of 38 weeks and the cow was eventually sold as incurable. There can be no doubt that this quarter was infected, because *Str. agalactiae* was isolated, often in large numbers, by direct plating on 13 occasions, yet on seven occasions the milk was positive only after incubation of the sample and would have been recorded as negative by direct plating. Moreover, we have isolated mastitis streptococci from the udder tissue of cows when these organisms had only been occasionally isolated from the corresponding incubated milk samples (Francis, 1948), a fact which may provide one explanation for "breakdowns" in control work.

Our original technique for the examination of milk samples has already been described. Similar techniques are commonly adopted and are suitable for research, but they would be impracticable for large scale work and are very wasteful of plates, because many samples are negative, particularly after control has made some progress. Various other methods have been used to detect growth in incubated milk samples. One of the simplest which has been extensively adopted is the microscopic examination of smears. We examined 1,160 smears from samples which were simultaneously streaked on blood-agar plates; colonies of streptococci were then picked and identified. The results are shown in Table II (*overleaf*), from which it will be seen that *Str. agalactiae* was detected by microscopic examination in 107 of 118 samples (90·68 per cent.) shown to contain organisms by streaking the samples on blood-agar plates; *i.e.*, only eleven positive samples were missed, whereas in the same series 40 samples were negative by direct plating. On the other hand, the microscopic examination revealed streptococci which were not *Str. agalactiae* on 34 occasions (24·11 per cent.); an obvious disadvantage of the method. In addition, the preparation and examination of large numbers of smears is a laborious procedure.

TABLE II

PROPORTION OF ORGANISMS REVEALED BY CULTURAL METHODS, WHICH WERE DETECTED BY MICROSCOPIC EXAMINATION OF INCUBATED MILK SAMPLES

Plate readings	Number of organisms on plate[1]					
	4	3	2	1	Total	Percentage
Str. agalactiae	36/36	14/16	25/26	32/40	107/118	90·68
Str. dysgalactiae	1/1	0/0	1/1	9/12	11/14	78·57
Str. uberis	0	0	0	3/3	3/3	100
Other streptococci	4/5	2/2	2/5	12/21	20/33	60·6
Haemolytic staphylococci	1/1	0	9/10	0/31	19/42	45·24
Micrococci	6/8	5/6	20/39	15/83	46/136	33·82

[1] Each sample was plated on half a blood-agar plate with a loop delivering 1:100 ml. of milk (not gravity cream). Samples were then incubated and again streaked out on a blood-agar plate. Results were recorded in the following way:—
4 — Numerous organisms on the first plate.
3 — Moderate number of organisms on the first plate.
2 — A few organisms on the first plate.
1 — Organisms only on plate inoculated with the incubated sample.

The Value of Brom-cresol-purple as an Indicator of Growth

In the Hotis test milk is taken into tubes containing brom-cresol-purple to give a final concentration of 1:4,000. The samples are then incubated for 24 to 48 hours and the colour changes noted. The growth of *Str. agalactiae* produces rather characteristic changes, but it is generally recognised that a fairly large number of "false-positive" reactions are obtained, *i.e.*, reactions due to the growth of organisms other than *Str. agalactiae*. We have found that the above strong concentration of brom-cresol-purple tends to inhibit the growth of streptococci and have used a final concentration of 1 : 20,000; plus 1 per cent. glucose to stimulate growth, particularly in samples of poor quality milk. McCartney bottles containing 1·5 c.c. of 1:2,000 brom-cresol-purple and 10 per cent. glucose saline give this strength when half-filled. Samples are observed after 24 and 48 hours' incubation, and only those in which colour changes occur are streaked out.

The value of the brom-cresol-purple may be illustrated by the results of a number of herd tests summarised in Table III. An average of only 18 per cent. of all samples not containing organisms associated with mastitis were streaked out, so a very considerable amount of work was saved and the test missed only one positive sample which would have been detected by other methods.

TABLE III

ISOLATION OF *Str. agalactiae* FOLLOWING THE INCUBATION OF MILK SAMPLES CONTAINING 1:20,000 BROM-CRESOL-PURPLE

Herd	No. samples	Tubes positive, 24 hours			Tubes positive, 48 hours			*Str. agalactiae* missed[1]	Per cent. samples streaked out unnecessarily
		No.	*Str. agalactiae*	Other mastitis organisms	No.	*Str. agalactiae*	Other mastitis organisms		
1	63	5	0	5	8	0	5	?	4·76
2	127	7	2	0	26	0	4	0	21·26
4	75	19	7	4	12	4	1	1	20·00
6	212	24	9	2	44	7	4	?	20·75
Total	477	55	18	11	90	11	14		

[1] This figure is only available for the examinations of Herds 2 and 4 because in the others samples not showing colour changes were not streaked out.
[2] The number of samples streaked out which did not contain *Str. agalactiae*, *Str. dysgalactiae*, *Str. uberis* or haemolytic staphylococci is expressed as a percentage of the total number of samples.

The Necessity for the Addition of an Inhibitory Agent

Plain brom-cresol-purple and glucose have proved satisfactory when samples are taken carefully, but under routine conditions it hardly seems possible to dispense with an inhibitory agent to control the growth of Gram-negative organisms, and we compared the value of sodium azide and potassium tellurite for this purpose. In a series of four experiments three different dilutions of milk, naturally infected with *Str. agalactiae*, were added to freshly drawn sterile milk containing 1 per cent. glucose and 1:20,000 brom-cresol-purple. The effect of 1:10,000, 1:20,000 and 1:40,000 sodium azide and potassium tellurite, on the colour changes of the brom-cresol-purple, were then observed after 24 and 48 hours' incubation. The contents of the tubes were streaked on plates after 24 and sometimes 48 hours. The results are shown in Table IV, each figure representing the average results in six tubes or plates. In each of two further experiments three separate samples of bovine faeces were added to freshly drawn sterile milk containing 1 per cent. glucose and 1:20,000 brom-cresol-purple. The effects of the same concentrations of sodium azide or potassium tellurite were again observed. The results are shown in Table V, each figure representing the average result in six tubes or plates. The results in Tables IV and V are summarised in Table VI and it will be seen that samples containing equal strengths of sodium azide gave an average reading four times greater when inoculated with *Str. agalactiae* than with faeces, but with equal strengths of potassium tellurite the readings were only twice as great with *Str. agalactiae* as with faeces. The readings in control tubes inoculated with faeces and *Str. agalactiae*

TABLE IV

THE EFFECT OF SODIUM AZIDE AND POTASSIUM TELLURITE ON THE GROWTH OF *Str. Agalactiae* IN MILK CONTAINING 1 PER CENT. GLUCOSE AND 1:20,000 BROM-CRESOL-PURPLE

Reading	Experiment	Sodium azide				Potassium-tellurite						Brom-cresol-purple	
		1:10,000		1:20,000		1:40,000		1:10,000		1:20,000		1:40,000			
Colour changes in tubes after 24 hours	II/90	0		0		1·83		0·25		1·16		2·33		1·4	
	III/3	0		0·33		0·66		0·41		0·95		1·5		1·6	
	III/1	0·5		1·5		2·0		1·3		2·16		3·0		3·7	
	III/7	0·25		1·25		1·5		1·58		2·5		3·3		3·66	
	Average	0·19		0·77		1·50		0·89		1·69		2·53		2·59	
Colour changes in tubes after 48 hours	II/90	0		0·66		3·16		3·0		3·66		4·6		5·0	
	III/3	0·5		1·45		2·12		1·7		2·55		3·3		4·05	
	III/1	1·83		2·83		4·33		2·5		4·14		4·66		5·0	
	III/7	0·83		2·16		3·0		3·66		4·33		5·0		5·0	
	Average	0·79		1·78		3·15		2·72		3·67		4·39		4·76	
		A[1]	E[1]	A[1]	E[1]	A[1]	E[1]	A[1]	E[1]	A[1]	E[1]	A[1]	E[1]	A[1]	E[1]
Results of inoculating tubes, after 24 hours, on to plates	II/90	1·16	1·5	1·16	2·0	1·5	2·16	1·16	1·2	1·0	0·9	1·2	1·1	2·8	2·4
	III/3	0·66		1·23		1·49		1·75		1·91		1·91		1·23	
	III/1	2·0	1·5	2·33	1·5	3·0	2·33	2·5	2·5	2·83	2·5	2·5	2·5	3·0	3·0
	III/7	3·0	2·33	3·0	2·5	3·0	2·66	1·66	3·0	1·83	2·33	2·13	2·5	1·16	2·33
	Average	1·71	1·78	1·93	2·0	2·25	2·38	1·77	2·23	1·89	1·91	1·94	2·03	2·05	2·57

[1] In each experiment three dilutions of milk naturally infected with *Str. agalactiae* were added to normal unsterilised milk. There were two control tubes and two tubes of each dilution of inhibitor and infected milk so that each figure in the above table represents the result in six tubes or on six plates.
[2] A—The result of plating on blood-aesculin medium; E—The result of plating on Edwards' medium.
The maximum reading for the tubes was 6 and for the plates 3.

TABLE V

THE EFFECT OF SODIUM AZIDE AND POTASSIUM TELLURITE ON FAECAL CONTAMINANTS IN MILK CONTAINING 1 PER CENT. GLUCOSE AND 1:20,000 BROM-CRESOL-PURPLE

Reading	Experiment	Sodium azide			Potassium tellurite			Brom-cresol-purple
		1:10,000	1:20,000	1:40,000	1:10,000	1:20,000	1:40,000	
Colour changes in tubes after 24 hours	II/93	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0·5	1·5 3·0 3·0
	III/12	0 0 0	0 0 0	0 0 0	0·5 0 1·0	0·5 0 0	3·0 0 0	2·0 2·0 3·0
	Average	0	0	0	0·25	0·83	0·6	2·25
Colour changes in tubes after 48 hours	II/93	0 0·25 0	0 1·25 0	0·25 1·75 0·5	0·5 1·0 0·5	0·5 3·0 1·0	0·5 3·0 4·0	1·75 5·0 5·0
	III/12	0·5 0·5 0·5	0·5 0·5 1·0	0·5 0·5 3·0	1·0 2·0 1·0	3·0 3·0 3·5	4·0 3·0 4·0	5·0 5·0 5·0
	Average	0·29	0·54	1·08	1·0	2·33	3·08	4·46
Results of inoculating tubes after 24 hours' incubation on to aesculin blood-agar plates	II/93	M 1·5 M 1·5 M 3·0	M 3·0 M 2·5 M 3·0	M 3·0 M 3·0 M 3·0	M 3·0 Sr 3·0 Sa 2 M 3·0	M 3·0 Sr 2·0 C 3·0 M 3·0	M 3·0 Sr 1·0 C 3·0 M 3·0	C 3·0 C 3·0 C 3·0
	III/12	Sr 1·5 Sa 0·5 Sa 1·0	Sr 0·5 Sa 2·0 Sa 3·0 Sa 3·0	Sa 3·0 Sa 3·0 Sa 3·0	Sr 0·5 C 3·0 Sr 0·5 C 2·0 C 3·0	Sr 0·5 C 3·0 Sr 0·5 C 2·5 Sr 0·5 C 2·5	Sr 1·0 C 2·0 C 3·0 C 3·0	C 3·0 C 3·0 C 3·0
		Sr M Sa 0·25 1·0 0·25	Sr M Sa 0·09 1·41 1·33	Sr M Sa 0 1·5 1·5	Sr M Sa C 0·67 1·0 0·33 1·33	Sr M C 0·58 1·0 1·83	Sr M C 0·33 1·0 1·9	C 3·0
Results of inoculating tubes after 24 hours' incubation on to Edwards' plates	II/93	0 Sr 3·0 0	0 Sr 3·0 0	C 1·0 Sr 3·0 Sr 1·5 C 1·0	0 Sr 3·0 C 1·0	0 Sr 3·0 C 1·5 C 1·0	0 Sr 3·0 C 2·0 C 1·0	C 3·0 C 3·0 C 3·0
	III/12	Sr 2·0 Sr 0·5 Sr 1·5	Sr 2·5 Sr 2·5 Sr 2·5	Sr 2·0 2·5 2·0	Sr 2·5 Sr 2·5 Sr 1·0 C 1·5	Sr 1·5 C 1·5 Sr 2·5 Sr 2·0	Sr 0·5 C 2·5 Sr 0·5 C 2·5 Sr 1·0 C 3·0	C 3·0 C 3·0 C 3·0
		Sr 1·17	Sr 1·8	Sr 1·83 C 0·33	Sr 1·5 C 0·41	Sr 1·5 C 0·66	Sr 0·83 C 1·83	C 3·0

The effect of adding three different samples of faeces to milk (final dilution 1:1,000) was studied in each experiment. Each figure represents the average results in two tubes. There was often a variety of organisms on the plates.

Sr = Streptococci; Sa = Staphylococci; M = Micrococci; C = Coliform organisms or other "contaminants."

The maximum reading for the tubes was 6 and for the plates 3.

TABLE VI[1]

SUMMARISED RESULTS SHOWING THE EFFECT OF VARIOUS CONCENTRATIONS OF SODIUM AZIDE AND POTASSIUM TELLURITE ON THE GROWTH OF *Str. agalactiae* AND ORGANISMS

		Milk infected with			Milk infected with	
		1:1,000 bovine faeces	Various concentrations of *Str. agalactiae*		1:1,000 bovine faeces	Various concentrations of *Str. agalactiae*
Tube readings after 24 and 48 hours' incubation	Sodium azide	0·32	1·36	1:40,000 Sod. azide	0·54	2·33
	Potass. tellur.	1·23	2·65	1:10,000 Pot. tellur.	0·63	1·81
	Control	3·36	3·68	Control	3·36	3·68
The result of streaking tubes after 24 hours' incubation on aesculin-blood-agar plates	Sodium azide	G[2] C[2] 2·44 0	1·96	1:40,000 Sod. azide	G C 3·0 0	2·25
	Potass. tellur.	G C 1·64 1·68	1·87	1:10,000 Pot. tellur.	G C 2·0 1·33	1·77
	Control	G C 0 3·0	2·05	Control	G C 0 3·0	2·05

[1] Figures on the left-hand side are the averages of the results in 72 tubes or plates, and on the right-hand side in 24 tubes or plates.

[2] G = Gram-positive cocci.

[3] C = Coliform and other contaminating organisms.

were almost identical. It can further be seen that 1:40,000 sodium azide produced a better bacteriostatic effect against faecal contamination than did 1:10,000 potassium tellurite. The results of plating milk after 24 hours' incubation show that 1:40,000 sodium azide inhibited the growth of *Bact. coli* but allowed the growth of various Gram-positive cocci. This strength did not seriously interfere with the colour changes in tubes inoculated with *Str. agalactiae*.

We compared the value of samples containing brom-cresol-purple and glucose plus 1:20,000 sodium azide and 1:20,000 potassium tellurite with our standard technique in a small series of samples from clinical cases and the results are shown in Table VII. It will be seen that *Str. agalactiae* was isolated 30 times by our standard technique,

TABLE VII

RESULT OF EXAMINING MILK SAMPLES BY A STANDARD TECHNIQUE[1] AND BY PLATING OUT OF THOSE WHICH PRODUCED COLOUR CHANGES IN BROM-CRESOL-PURPLE AFTER 24 OR 48 HOURS' INCUBATION, IN THE PRESENCE OF 1:20,000 SODIUM AZIDE OR POTASSIUM TELLURITE

Organism	Classification according to standard technique								Total positives		
	Positive by direct plating[1]				Incubated sample positive[1]						
	Results in B.C.P. tubes				Results in B.C.P. tubes						
	24 hours		48 hours		24 hours		48 hours		Standard technique	Tellurite tubes	Azide tubes
	Tell. +	Az. +	Tell. +	Az. +	Tell. +	Az. +	Tell. +	Az. +			
Str. agalactiae	19	14	1	6	7	3	3	5	30	30	28
Str. dysgalactiae	6	7	3	2	2	2	1	2	18	12	13
Str. uberis	1	1					1	1	3	2	2
Haemolytic staphylococci	1	1	2	2			1	1	4	4	4
C. pyogenes	1	1							1	1	1

[1] See footnote, Table II, for details.

30 times from tubes containing potassium tellurite and 28 times from tubes containing sodium azide. There was a fair correlation between the number of organisms by the standard technique, and the rate of colour changes in the tubes, but as would be expected sodium azide retarded the colour changes. It seems, therefore, that it would not be harmful to add 1:20,000 to 1:40,000 sodium azide to milk containing brom-cresol-purple and glucose. Indeed, this is a common practice of some workers (Little & Plastridge, 1946), but it appears that further experiments are necessary to decide the optimum concentration for routine purposes.

THE RECOGNITION OF *Str. agalactiae*

Numerous attempts have been made to produce an agar or liquid medium in which *Str. agalactiae* could be recognised. None of the liquid media have been really satisfactory and they need not be considered here because the use of plates at one stage seems essential to ascertain whether the growth is a pure culture or not.

Edwards' blood-agar medium containing crystal-violet to inhibit staphylococci, and aesculin, which gives colour changes when split, was widely used for deep plating, but it appears that *Str. agalactiae* cannot be recognised with certainty in these deep plates and many workers have omitted aesculin from the medium. More recently Plastridge *et al.* (1938) used blood-agar plates and Edwards' medium for the surface streaking of 525 milk samples which were shown by microscopic examination to contain streptococci. Identification of isolations obtained from colonies on Edwards' medium showed that 95·7 per cent. of grey-blue haemolytic colonies and 94·9 per cent. of grey-blue non-haemolytic colonies were *Str. agalactiae*. In comparison, only 4·1 per cent. of the colonies classed as brown were identified as *Str. agalactiae*. They concluded that Edwards' medium was about 95 per cent. effective in separating *Str. agalactiae* from other types of streptococci found in freshly drawn milk. The ability of the medium to inhibit the growth of staphylococci aided materially in detecting *Str. agalactiae* in incubated samples that contained large numbers of staphylococci. It is, however, often disadvantageous to inhibit staphylococci because they may be associated with mastitis; a further disadvantage we have noted is that Edwards' medium inhibits some strains of *Str. uberis* and greatly reduces or even inhibits the growth of some strains of *Str. agalactiae*. Cunningham *et al.* (1946) made similar observations. For these reasons most workers only use Edwards' plates for samples which give unsatisfactory results on blood-agar plates.

It is generally admitted that *Str. agalactiae* cannot be recognised with certainty on blood-agar, so we have used blood-agar plates containing 1 per cent. aesculin for streaking out milk samples producing colour changes in brom-cresol-purple. Edwards' medium was used only if the first plates were overgrown with micrococci or staphylococci. Similar appearances were observed on both aesculin blood-agar plates and Edwards' medium:—

Str. agalactiae—blue-grey translucent colonies usually with a narrow zone of haemolysis. No "viridans" appearance or diffuse brown-green discoloration of medium.

Str. dysgalactiae—blue-grey colonies, but darker and more opaque than *Str. agalactiae*, surrounded by a small green zone giving a "viridans" appearance but no diffuse brown discoloration of medium.

Str. uberis—opaque brownish colonies with a diffuse browning of the medium when the colonies are numerous. In a suitable oblique light it can be seen that the fluorescent appearance produced by aesculin has been removed. Similar changes are also produced by various faecal streptococci.

In a small series of routine samples from clinical cases *Str. agalactiae* was isolated 44 times. It was correctly forecast 41 times, it was missed once and no forecast was made on two occasions. *Str. dysgalactiae* was correctly forecast on 33 occasions and forecast as *Str. agalactiae* on four occasions. These results are not quite so good as those obtained by Plastridge *et al.* (1938), but they support the great value of the method.

As a routine we have accepted the following criteria to identify the various streptococci:—

Organism	Group precipitin reactions		Biochemical reactions							
	B	C	Litmus milk	1:1000 methylene blue mlk	Glucose	Salicin	Inulin	Raffinose	Mannite	Hydrolysis of sod. hippurate
Str. agalactiae	+	—	A,C	—	+	±	—	—	—	+
Str. dysgalactiae	—	+	A,R	—	+	—	—	—	—	—
Str. uberis	—	—	A,C	—	+	+	+	—	+	+

A = acid; C = clot: R = reduction.

In order to see if fewer tests could be used to identify organisms giving "viridans" or brown-green appearances on aesculin-blood-agar plates the results of examining 689 streptococcal cultures obtained during work on the treatment of clinical mastitis, and 1,089 during the control of *Str. agalactiae* infection, have been classified into the following groups:—

		Salicin	*Raffinose*	*Hippurate*
Group	1	+	—	+
Group	2	—	—	—

In Table VIII the number of strains of *Str. uberis* which were isolated are shown, together with the number of strains giving Reaction 1 which were not *Str. uberis*; the same has been done for *Str. dysgalactiae* and Reaction 2. For completeness the number of times *Str. agalactiae* was isolated has been included in Table VIII, although these strains would not, of course, have given a "viridans" or green-brown appearance on aesculin-blood-agar. It can be calculated from this table that:—

TABLE VIII

THE CULTURAL CHARACTERISTICS OF STREPTOCOCCI ISOLATED DURING WORK ON THE TREATMENT OF CLINICAL MASTITIS AND THE CONTROL OF *Str. agalactiae* INFECTION

Streptococci isolated during work on	Group 1		Group 2		*Str. agalactiae*	Streptococci not giving Reaction 1 or 2	Total
	Str. uberis	Other streptococci	*Str. dysgalactiae*	Other streptococci			
Treatment of clinical mastitis	137	9	133	6	294	110	689
Control of *Str. agalactiae* infection	251	23	151	13	407	244	1,089
Total	388	32	287	19	701	354	1,778

Many strains of *Str. agalactiae* would, of course, give Reaction 1, but they would not have produced a "viridans" or green-brown appearance on aesculin-blood-agar plates.

32 of 420 (7·6 per cent.) of strains giving Reaction 1 were not *Str. uberis*

19 of 306 (6·2 per cent.) of strains giving Reaction 2 were not *Str. dysgalactiae*

whereas of 1,077 streptococci which would have given "viridans" or green-brown appearances on aesculin-blood-agar plates, 675 (62·7 per cent.) giving Reaction 1 or 2 were correctly classified as *Str. uberis* or *Str. dysgalactiae*, and 340 (31·6 per cent.) were correctly shown not to be *Str. dysgalactiae* or *Str. uberis*. Only 51 strains, (7·05 per cent.) of those giving reactions 1 or 2, or 4·7 per cent. of the total, would have been wrongly classified as *Str. dysgalactiae* or *Str. uberis*.

On the basis of the foregoing work the following procedure for the large scale diagnosis of mastitis may be suggested:—

Milk samples are taken into McCartney bottles containing 1·5 c.c. of 1:2,000 brom-cresol-purple, and, say, 1:4,000 sodium azide in 10 per cent. glucose saline.* When these are half filled there is a final concentration of 1:20,000 brom-cresol-purple, 1:40,000 sodium azide, and 1 per cent. glucose. At this time any quarters yielding abnormally alkaline milk may be noted, this giving an indication of the existence of "mastitis." After return to the laboratory bottles containing samples from dry cows are half filled with plain broth adjusted to *p*H 6·8 to 7·0. Samples are then incubated and those showing colour changes after 16 to 48 hours' incubation are streaked on half an aesculin-blood-agar plate. Haemolytic staphylococci, Group C haemolytic streptococci and *C. pyogenes* produce the usual changes seen on plain blood-agar plates. In addition, *Str. agalactiae* produces typical blue-grey colonies usually with a narrow zone of haemolysis and no discoloration of the medium. It is felt that in routine work it would not be necessary to pick these colonies for further identification, but, in any event, a large number of saprophytic streptococci, *Str. uberis* and usually *Str. dysgalactiae*, could be dismissed as not *Str. agalactiae*. This cannot be done nearly as reliably with plain blood-agar. Many workers have omitted aesculin from Edwards' medium, but it would appear that aesculin and not crystal-violet is the more important constituent. Samples yielding plates overgrown with staphylococci or micrococci can be replated on Edwards' medium.

It may be held that even in routine work there should be complete identification of *Str. agalactiae*, but there seems to be little justification for the extra labour. As Pullinger (1946) contends, it is usually better to carry out a fairly reliable test at frequent intervals than a very accurate one occasionally. In addition, there can be little doubt that if precipitation methods were used exclusively in routine work the results reported would be slightly different from those obtained if fermentation tests were used, and would probably be little more reliable than the recognition of typical colonies on aesculin blood-agar, or Edwards' plates.

Nothing in the foregoing procedure is original except the use of aesculin blood-agar plates, but taken as a whole it appears to have advantages over other published methods:—

1. The dark blue colour produced in brom-cresol-purple tubes by alkaline milk gives some indication of the presence of "mastitis."

2. It is much simpler to note colour changes in tubes after incubation than to prepare and examine smears.

* Sample bottles containing 1·5 c.c. of the mixed solution may be autoclaved at a pressure of 10 lb. per square inch for 20 minutes without harming its specific bacteriostatic effect. Aseptic filling of bottles is, therefore, unnecessary.

3. The rate at which colour changes occur provides a rough index of the severity of infection. It is believed that this and the indication provided in (1) is all that is necessary in large scale control work and that the rather laborious leucocyte counts carried out by American workers (see Little & Plastridge, 1946) are not necessary.

4. The number of samples to be plated is much reduced.

5. By the use of aesculin blood-agar instead of Edwards' medium a fairly complete bacteriological picture is obtained and crystal-violet sensitive strains of *Str. agalactiae* are not missed. In contrast to plain blood-agar either medium permits the recognition of *Str. agalactiae* with sufficient certainty for routine control work, so nearly all subsequent bacteriological tests are avoided. The small proportion of samples yielding plates overgrown with staphylococci or other Gram-positive organisms can be replated on Edwards' medium.

Summary

1. Methods which have been used for the diagnosis of mastitis are briefly discussed. In experimental work on the control of *Str. agalactiae* infection 0·01 c.c. amounts of milk were plated directly on to the surface of blood-agar plates, the samples were then incubated and replated.

2. *Str. agalactiae* was isolated 209 times by direct plating and an additional 90 times following incubation of the sample. Evidence is presented supporting the value of incubated milk samples.

3. In order to simplify the foregoing test the original plating was omitted and milk simply taken into bottles containing 1·5 c.c. of 1:2,000 brom-cresol-purple and 10 per cent. glucose-saline to give a final concentration of 1:20,000 brom-cresol-purple and 1 per cent. glucose when the bottles were half filled with milk. Samples showing colour changes after 24 or 48 hours' incubation were then streaked on plates. The method was shown to be as sensitive as most other tests for the detection of *Str. agalactiae* and only 18 per cent. of all tubes not containing organisms associated with mastitis were streaked out, so there was a considerable saving in labour.

4. In routine work the addition of an inhibitory agent seems essential to prevent the growth of Gram-negative organisms. The value of 1:10,000, 1:20,000 and 1:40,000 sodium azide and potassium tellurite was compared. Milk containing equal strengths of sodium azide gave an average reading four times greater when inoculated with *Str. agalactiae* than with faeces, but with equal strengths of potassium tellurite the readings were only twice as great with *Str. agalactiae* as with faeces. The readings in control tubes inoculated with *Str. agalactiae* or with faeces were almost identical. The results of plating infected milk after 24 hours' incubation showed that 1:40,000 sodium azide inhibited the growth of *Bact. coli* but allowed the growth of various Gram-positive cocci. This strength did not seriously interfere with the colour changes in tubes inoculated with *Str. agalactiae*.

5. The fact that *Str. agalactiae* could be recognised with a fair degree of certainty when growing on the surface of Edwards' medium was confirmed. It was further shown that it produced similar characteristic changes on aesculin-blood-agar plates. It was concluded that these plates should replace plain blood-agar plates in work on the control of mastitis and that when this is done further laboratory methods for the recognition of *Str. agalactiae* are rarely necessary. Edwards' plates can be used if any samples are overgrown with micrococci, or contaminants. Colonies producing a "viridans" or green-brown appearance on these plates can be classified as *Str. dysgalactiae* or *Str. uberis*, by their action on salicin, raffinose and hippurate with an error of 7 per cent.

Acknowledgment.—I am indebted to Mr. R. W. White, A.I.M.L.T., for his assistance with this work.

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CLINICAL COMMUNICATIONS

Laminitis and its Treatment by a New Anti-hystaminic: "Anthisan"

WM. F. KOCHAN, M.R.C.V.S.,
Spilsby, Lincs

For long the treatment of laminitis of the larger domestic animals has been unsatisfactory, partial recovery with the attendant damage to the structures of the hoof and chronic lameness being the most common result.

Since reading the excellent paper by J. Chavance,* who based his work on that of J. Tinel's on the sympathetic system, I have been eager to try the treatment he recommends. However, as there were no soluble antihistaminics available to me at that time, I tried bulk doses of benadryl (P.D.) orally in selected cases, but without appreciable benefit.

After discussion with Messrs. May & Baker,† they were able to supply me with a 5 per cent. pyranisamine maleate—"Anthisan"—for field trial.

To prove the efficacy of the treatment, cases were selected which showed no noticeable response to the usual one adopted in my practice. The histories of three cases in which the results with "Anthisan" were spectacular, are as follows:—

Case 1

Subject.—A six-year-old child's riding pony. The animal, which was in "top heavy" condition, had been treated about six months previously for acute laminitis, with little result. When called in, I found her in great pain and scarcely able to stand. There were marked changes in all four feet—the soles dropped and the walls elongated antero-posteriorly and upturned. The pony stumbled along on her heels. The cause, in my opinion, was dietetic in origin, coupled with too little exercise.

Destruction was considered, but postponed a week to try "Anthisan." Intravenous injection of 20 c.c. "Anthisan," 5 per cent., was followed by restlessness, a little sweating and twitching of the mouth and nostrils as in nausea. The pulse quickened slightly but soon settled. These signs resolved in about half an hour, when she was left resting; 24 hours later she was obviously better but still had to be driven to walk. A further 20 c.c. were given intravenously. On the following day she walked with little difficulty, and was in very little pain; 20 c.c. more "Anthisan" were injected. Next day she cantered away when we went to halter her. Improvement was maintained and a week later the feet were trimmed. This was followed by a little tenderness, which disappeared within 48 hours. No other treatment was given or required. The diet remained the same throughout.

Case 2

Subject.—A four-year-old pedigree Guernsey bull. Suddenly developed acute laminitis in all four feet. Together with the usual symptoms of great pain, fever, anorexia and rapid loss of condition, a pustular rash broke out all over the body and legs. He had been tied up all winter and this, together with a change of diet 14 days previously, I suggested to be the cause.

My colleague, Mr. A. Crosbie, first attended him, thinned out the soles of the feet, changed the diet and purged with "Altan." The animal's condition worsened, and a week later he was given 10 c.c. "Anthisan," intravenously. There were no noticeable signs of discomfort from the injection, and 24 hours later he was much improved; 20 c.c. were then given with no untoward reaction. Next day all the painful symptoms had disappeared, the temperature was normal and the bull eating well. Forty-eight hours later the owner reported the animal normal, and ready for his work. The rash disappeared in a week without treatment. The feet remained normal in appearance.

Case 3

Subject.—A year-old pedigree large white gilt. She was in very fat condition and well advanced in pregnancy. She had acute laminitis, was unable to stand, and had refused food for 48 hours. Her temperature was 104·2° and the faeces were somewhat harder than normal; 10 c.c. "Anthisan" was injected behind the ear. No other treatment was given. Twenty-four hours later the tem-

* Chavance, Jean (1945). "Théorie histaminique de la fourbure aignê du Cheval: Son traitement par les antihistaminiques de synthèse." *Bull. Acad. vét. Fr.*, **18**, 260-266. Quoted in *Vet. Med.* (1946) 41, No. 6.

† I wish to thank Messrs. May & Baker for their kindness in supplying me with the "Anthisan."

perature and bowel action were normal and she had drunk a good quantity of thin gruel. The feet were still painful, but she got up on her own, although trembling a great deal when she did so. 10 c.c. "Anthisan" was injected on each of the following two days, by which time she walked out with no difficulty and was left grazing in the paddock.

In another case of acute laminitis in a mare, with superpurgation following an acute obstructive colic, the results were inconclusive as the mare died six hours after the "Anthisan" was given.

Conclusion.—In my opinion, soluble antihistaminics have revolutionised the treatment of laminitis.

* * * * *

Prolapsus Vesicae in the Cow

A. A. KIDD, M.R.C.V.S.,

and

T. MacINNES, M.R.C.V.S.,

Thame, Oxon

As we can find only one reference* to the above condition in the veterinary literature at our disposal, we feel that the following case merits record.

Subject.—Seven-year-old Shorthorn cow in very poor condition.

History.—We were called to examine this cow, which was reported to be suffering from "indigestion," on April 4th last. Upon examination, the cow was found to be heavily in calf and, although no rectal examination was made, her condition suggested that she was probably carrying twins. Her temperature was 103°; respiration was rapid. She was not eating and gave clinical evidence of severe indigestion, associated with "venous pulse." It was then thought that possibly she had a foreign body in the reticulum. Instructions to place the animal in such a position as to raise her forequarters were therefore given, and a mixture of ammon. carb., sodii bicarb., nucis vom, ginger, gentian, pulv. locust and pulv. anisi left to be given three times a day.

Examination the following day showed her to be easier; her temperature was normal and she was taking a little food. There were no signs of her calving at an early date and the owner was unable to say when she was due as she had been recently purchased.

On April 6th we received a message that she had started to calve. On our arrival the cow was found to be recumbent, straining heavily and a large round fluctuating swelling, similar to a placenta, was exhibited on the lips of the vulva. Closer examination showed this to be the bladder, which had become bent backwards on the neck of the urethra, presumably through a fissure in the lower vaginal wall. This condition presented an absolute obstruction to parturition and beyond it two calves could be identified in the body of the uterus.

Treatment.—10 c.c. of 2 per cent. Novutox was given into the epidural space to control the straining. The outside of the bladder and surrounding tissue were carefully cleansed with a weak solution of dettol, after which an epidural needle was used to puncture the bladder and drain off the urine. This took approximately 15 minutes, after which the bladder was returned into the abdominal cavity, and two bull calves, both alive, were removed without any undue difficulty. Calcium borogluconate was then administered subcutaneously. Three vaginal clips were introduced very deeply as a precaution against the bladder returning through the vagina. Six hours later the cow was up and feeding and she made an uninterrupted recovery.

It is presumed that the condition was caused by pressure of the two foetuses, accentuated by the fact that the animal's forequarters were raised about two feet. This case should serve as a reminder not to presuppose that all smooth fluctuating swellings present in the vagina at parturition are necessarily foetal membranes.

* "Fleming's Veterinary Obstetrics," 4th Edition, reprinted 1944; page 253.

Speaking to the Sussex Herd Book Society, Dr. John Hammond asserted that there would be no appreciable increase in feeding-stuffs in the next five to 10 years. One way to overcome the difficulty was not to waste food on bad types of animals. The look of animals was not always a reliable yardstick, and he advised breeders to stick to old bulls that had bred well.

ABSTRACT

[A Photosensitized Keratitis in Young Cattle following the Use of Phenothiazine as an Anthelmintic. Whitten, L. K., Filmer, D. B., & Clare, N. T. (1947.) *Aust. Vet. J.* **23**. 336-348.]

The condition develops 24 hours after the administration of phenothiazine, in full anthelmintic doses.

The symptoms described are lachrymation, with oedema of the periorbital skin of the upper eyelid. Later a diffuse corneal opacity appears, which in severe cases is complicated by ulceration. Complete resolution takes four to five days, but may require three to four months where serious ulceration has occurred.

The photosensitisation is confined to young stock in poor condition, and a factor which induces the reaction is exposure to strong sunlight from 12 to 36 hours following dosing.

The photosensitisation can be prevented by protecting the calves from direct sunlight, during the day following administration of the phenothiazine.

The metabolism of phenothiazine in ruminants is described, and the photosensitising agent identified.

D. W. J.

STERILITY DANGER IN USE OF SELENIUM AS AN INSECTICIDE

The Bristol Correspondent of *The Times* reports that a warning against the use of sodium selenate as an insecticide has been issued by Dr. Hubert Martin, biochemistry expert on the staff of the Long Ashton research station at Bristol University. The insecticide (said Dr. Martin) might cause sterility in humans and animals, and might make hair drop out and nails fall off. In parts of the United States where selenium occurred naturally in the soil, stock feeding on the land lost their hair and generally deteriorated in condition, but plants growing on the soil were free from small insects and selenium was experimented with as an insecticide. Flower-growers in this country were using it without suspecting its dangerous properties. Tests at Long Ashton showed that in wheat treated with selenium the wheat weevil survived but became sterile. A chicken fed on wheat grown in selenium soil laid eggs, but they would not hatch.

* * * * *

Trivia

Research in Boston has progressed not only in medicine but also in the canine world. In one of the best residential suburbs I saw a dignified lady leading a small well-groomed and sedate-looking dog. Her dress and deportment were of the late Victorian era. In her left hand she carried an elaborately carved walking stick and in her right the longest lead I have ever seen—18 ft. if an inch. At first glance I was puzzled by this pair, but as the trees and posts were passed I marvelled at their ingenuity and team work. It was the long lead that provided the right time interval, so that neither the dog nor the mistress had to wait and the dignity of neither was upset. Not once did the long lead tighten; never did the dog appear to be striving to reach a post, and even if he did dally slightly over a particularly attractive post he still was not jerked off his tripod stance. What integration! One felt like crying out "Oh, well timed sir!"—A "Peripatetic Correspondent" in *The Lancet*.

. . . . .

Here (says *The Daily Mail*) is a short essay on the cow which is also a lesson on how to write English. It was written by a child of ten, and is guaranteed genuine:—

"The cow is a mammal. It has six sides—right, left, an upper and below. At the back it has a tail on which hangs a brush. With this it sends the flies away so that they do not fall into the milk. The head is for the purpose of growing horns, and so that the mouth can be somewhere.

"The horns are to butt with, and the mouth is to moo with. Under the cow hangs the milk. It is arranged for milking. When people milk, the milk comes and there is never an end to the supply. How the cow does it I have not yet realised, but it makes more and more. The cow has a fine sense of smell; one can smell it far away. That is the reason for the fresh air in the country."

. . . . .

Any offer?—"Animal lovers.—Chairman (honorary) of International Animal Protection Society needs a Motor Car by gift, loan, or concessionary sale."—*Times* Advt.

Treatment of Tetanus

In the prophylactic treatment of tetanus much advance has been made in recent years through the discovery of the vaccinating effect of tetanus toxoid. In some countries, where the risks of tetanus are high, vaccination against tetanus by this method has been made obligatory in the same way as vaccination by a similar method against diphtheria. During the late War the results recorded by the British and American armies lent conclusive information regarding the efficacy of the method.

It has been otherwise with therapeutic treatment, for although anti-serum ("antitoxin") has been commonly employed in declared cases of tetanus, injected by various routes, in large and frequently repeated doses, the results obtained, on the whole, have not been nearly so satisfactory as those obtained in the treatment of human diphtheria. Since 1926, however, some significant improvement in the prospects has been forthcoming, mainly as the result of observations made by French workers, which have recently been summarised by Couvy, L. (1947).*

The main difficulty confronted in serotherapy appears to be that the serum proteins containing the specific immune properties are of a molecular size too large to traverse the "blood brain barrier" represented by the meninges and the walls of the blood capillaries, such as those of the choroid plexus, which supply the brain and other parts of the central nervous system. The so-called immune bodies after subcutaneous, intravenous, or even intrathecal inoculation are therefore unable to come into intimate contact with the tetanus toxin already attached to the cells of the central nervous system to neutralise it effectively. Not only is the barrier impermeable to tetanus anti-toxin, but also, as is well known, to a large number of medicinal agents, such as potassium iodide, neosalvarsan, and quinine hydrochloride. A few medicinal agents, however, do not comply with this rule, such as, in particular, urotropine, which not only traverses the renal capillary plexuses and has been used for this reason for a long time in affections of the urino-genital tract, but also traverses similarly those of the central nervous system and renders the barrier represented by them permeable to other agents which otherwise are incapable of traversing it. Thus, working upon rabbits, it had been shown that urotropine facilitates the penetration of viruses, haemolysins, and anti-bacterial substances through the capillary-meningeal barrier. Likewise, some medicinal substances, such as neosalvarsan, were enabled to overcome this obstacle. Applying these findings to treatment of disease in the human subject, it was found, firstly, that several cases of advanced cerebro-spinal meningitis, in which the condition was such through membranous formation that the anti-serum could not be injected direct in the usual way into the cerebro-spinal canal, were rapidly cured when the serum was injected subcutaneously after a preliminary injection of urotropine intravenously; secondly, in French West Africa, cases of tabes (nervous syphilis) which had entirely failed to respond to prolonged arsenical treatment, were often spectacularly improved if each injection of neosalvarsan was preceded by intravenous injection of 1 g. of urotropine; thirdly, cases of human sleeping sickness (trypanosomiasis) in the second or third stages of attack sometimes showed satisfactory improvement after combined urotropine-arsenical treatment.

In 1931, records of 31 cases of human tetanus treated according to the above system were available, and following upon the experience gained with the earlier cases, the technique adopted in the later series came to be: (1) injection of 20 c.c. of serum, intravenously, or subcutaneously if the former is impracticable; (2) after half an hour, intravenous or subcutaneous injection of urotropine (0·50 g. in young children: in some sucking infants, the urotropine was given by ingestion); (3) half an hour after the injection of urotropine, intravenous or subcutaneous injection of anti-serum in quantities depending upon the severity of the disease and age of the patient. The first dose of serum varied between 80 and 120 c.c. for an adult, and the total quantity used in treatment ranged between 320 and 620 c.c. In one young girl, three years old, 70 c.c. proved sufficient.

Of 17 cases in this later series over one-half of which were very severe cases and two cases of umbilical tetanus in sucking infants, only one death was recorded, namely, in a child seven years old admitted to hospital on the fourth day of symptoms and dead three days after admission.

Following the above initial results, a number of recoveries after treatment by the method have been recorded by several other workers, and the method is therefore highly promising, for whereas figures amounting to 50 per cent. mortality in a large series of cases had been recorded after treatment with serum alone, or about 40 per cent. in cases treated with serum combined with anaesthesia, the figures though smaller, now available for cases subjected to combined urotropine-serum treatment, are very markedly more favourable. Combined serum-anaesthesia treatment is now known to be attended with a very large degree of risk, although the proportion of recoveries appears to be sensibly higher than with serum alone. The method of administering serum in combination with toxoid ("anatoxin") advocated by Ramon in 1938 seems to have given demonstratively better results in the hands of several other workers. Couvy is of the opinion that eventually some compromise between that method and the combined urotropine-antitoxin method may prove to offer the best solution in practice. Meanwhile, however, opportunities are presented to veterinarians in practice to modify, with better promise of success, the methods of treatment available to them, using the relatively simple readjustments in technique to be readily deducted from the above summary.

J. T. E.

* Couvy, L. (1947). Quelques Notes sur le traitement du tétanos. *Bull-Acad. Méd.*, **111**, 143.

REPORT

[Department of Veterinary Science and Animal Husbandry, Tanganyika Territory. Annual Report for 1945.]

The Introduction to this Report stresses the man-power difficulties of the Department, which had to send several officers on recuperative leave during the year; officers who had not been home for many years owing to the war. Even at the best of times, the authorised establishment of the Department allows for only one field veterinary officer for every 300,000 cattle and an almost equal number of sheep and goats; but in 1945 seven posts were unfilled, making this ratio even higher.

The expenditure of the Department during the year was some £113,000, of which £26,000 was met from local funds. This left £87,000 to be contributed by the United Kingdom which, however, received over £63,000 in revenue from Tanganyika's very profitable livestock industry.

Disease control measures against rinderpest included a total of 2,245,913 inoculations during the year, and in spite of the difficulties associated with game the prospects of eradication appeared hopeful. Quarantine restrictions and mass inoculation further reduced the incidence of contagious bovine pleuro-pneumonia. Tick-borne East Coast fever remains as one of the most serious obstacles to the development of the livestock industry. In areas where it is enzootic the calf mortality is about 50 per cent. The causative parasite resists all attempts at treatment, and destruction of the ticks remains the only known method of prevention. The use of arsenical dips at weekly intervals had been the practice, but now hand-dressing was gaining favour, and had reduced the incidence of the disease to almost negligible proportions in some areas.

The position as regards trypanosomiasis remained more or less unchanged, the tsetse-fly advancing in some places and retreating in others where land had been reclaimed from the bush. The report suggests that experiments with DDT carried out in Tanganyika and Uganda may lead to a cheaper and more effective method of eliminating the tsetse fly than bush clearance. In Zanzibar a herd of zebu cattle, subjected to frequent attack by tsetse and consequently to trypanosomiasis infection, had been kept in good condition and reasonable milk production for two years by monthly intravenous injections of tartar emetic.

Anthrax is stated to be ubiquitous. Foot-and-mouth disease was virtually enzootic and caused serious losses. There were indications that the action of the virus on the pituitary might bring about a long-haired condition of the coat.

Contagious abortion was widespread, but no case of rabies had been reported during the year; 685 ox carcases were condemned on account of tuberculosis, out of a total of 53,407 oxen slaughtered.

In the Laboratory, well over a million c.c. of anti-rinderpest vaccine were produced during the year, in spite of the fact that for most of the time a newly arrived veterinary officer had the task of running the laboratory without professional help.

A livestock census showed that there were rather more than six million cattle in the territory, sheep and goats together numbering five million.

Weekly Wisdom

The genius of any single man can no more equal learning, than a private purse hold way with the exchequer.—Bacon, "Novum Organum and Advancement of Learning." Edited by Joseph Devey, M.A., and published by Henry G. Bohn, London, 1853.

QUESTIONS IN PARLIAMENT

Caseous Lambs: Meat Importation (Regulation)

Captain John Crowder asked the Minister of Food if he will make a statement as to what is the purpose of Statutory Instrument No. 886 of 1948.

Doctor Summerskill: The new regulation has been made to permit the importation of carcases of mutton and lamb from which a lymphatic gland has been removed. Our regulations as now amended are in line with those in the Southern Dominions and other exporting countries where such meat is used in the ordinary course for human consumption.

Captain Crowder: Am I to understand that this Order does not apply to beef?

Doctor Summerskill: Experts tell me that it can be found in beef, but it very rarely is; it is generally found in mutton.

Doctor Barnett Stross: Can the Minister tell the House what steps are taken in the way of inspection of these carcases in order to make quite certain that they are fit for human beings to eat?

Doctor Summerskill: Yes, Sir. I am only too prepared to reassure the House. A very careful inspection is made, and I understand that the prescapular, superficial-inguinal, supra-mammary and precrural lymphatic glands are all removed. In addition, if a state of emaciation is found and the glands are affected, then the carcase is destroyed.

Mr. Butcher: Is it not a fact that the steps now taken by the Minister have been urged upon him for many months past by the Dominions and other people interested in increasing the meat supply?

Doctor Summerskill: I was with the hon. Gentleman in Australia in 1945, when we examined some of these carcases, and I took a special interest in the matter then. We wanted to be quite sure that this complaint was not communicable to human beings, and that is why we have delayed in making this amendment.

Mr. Scollan: Can my hon. Friend say what steps are being taken to let the people know that this kind of meat is being supplied to them in the butchers' shops? Will districts have it imposed upon them without their knowledge?

Doctor Summerskill: I have already made it clear that the meat that will be used will be quite as sound as any other meat that has not had the lymphatic gland removed from it.

. . . . . .

Sodium Selenate Insecticide

Mr. Janner asked the Minister of Agriculture whether he is aware that sodium selenate insecticide, used by horticulturists in this country, is dangerous to humans, causes the hair to fall out and nails to drop off and leads to sterility; and whether he proposes to take any steps to control its use.

Mr. G. Brown: Yes, I am aware of the toxic properties of sodium selenate. So far as I know, the horticultural use of this chemical in this country has been confined to experimental work, but I am making further enquiries and I am consulting the other Government Departments concerned as to what steps are necessary to control its use.

ROYAL COLLEGE OF VETERINARY SURGEONS

Animal Management Examination

List of Successful Candidates

Glasgow:

Asher, R. A.	Murdoch, M. I.
Baird, N. D.	Murray, G. D.
Bellinge, W. H.	Nelson, J.
Callow, M.	Parker, F. J.
Dick, I. B.	Pronger, Mrs. F. M.
Gibson, R.	Robertson, D.
Goalen, H.	Scott, W. N.
Isbister, J.	Schwartz, C.
Lawson, R. B.	Skinner, D. I.
Litchfield, F. L.	Smith, J. H.
Loudon, A. J. B. (Credit).	Smith, J. M.
Lyons, A. R.	Sothern, J. M.
McPhee, A. A.	Strang, J. R.
MacReady, P. H.	Townley, Miss D. M.
McCullock, B. (Credit).	Vallely, T. P.
MacIntyre, D. I.	Waddelow, I. R.
Moffat, R.	Whiteford, Miss J.
Mundell, D.	Young, D. K. M.

NOTES AND NEWS

Diary of Events

May 29th.—Meeting of the Biochemical Society at Oxford (Department of Biochemistry, University Museum), 1 p.m.
June 1st.—R.C.V.S. Annual General Meeting.
June 1st.—V.V.B.F. Annual General Meeting.
June 4th.—Meeting of the South Wales Division, N.V.M.A., at Aberystwyth (Agricultural Buildings, Alexandra Road), 2.15 p.m.
June 7th-8th.—R.C.V.S. D.V.S.M. Written Examination.
June 9th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 2.30 p.m.
June 10th.—Annual Meeting of the Lincolnshire and District Division, N.V.M.A., at Peterborough (Grand Hotel), 2.15 p.m.
June 10th.—R.A.V.C. Golfing Society Meeting, North Hants G.C., Fleet. (See Notice).
June 10th.—Meeting of the West of Scotland Division, N.V.M.A., Clinical Club, Glasgow Veterinary College, 7.30 p.m.
June 11th.—Summer Meeting of the South-Eastern Division, N.V.M.A., at Folkestone (The Leas Cliff Hall), 2.30 p.m.
June 11th.—R.A.V.C. Annual Dinner, Grosvenor House, London, W.
June 17th.—Central Veterinary Society's visit to the Compton Field Station of the Agricultural Research Council.
June 24th-25th.—R.C.V.S. Membership Written Examinations.
June 30th.—July 2nd.—Meetings of Council and Committees, N.V.M.A., in the Royal (Dick) Veterinary College, Edinburgh.

Sept. 8th to 15th (inclusive).—N.V.M.A. Congress at Southport.

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PERSONAL

Appointments.—The following appointments to the Colonial Veterinary Service are announced: of Mr. Alan H. Foster, M.R.C.V.S., as Veterinary officer, Malaya, and of Mr. John R. Knowles, M.R.C.V.S., as Veterinary Officer, Nigeria.

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Births.—Holmes.—On May 23rd, 1948, at 20, Howard Place, Carlisle; to Peggy (née Pomer), wife of Graham Holmes, M.R.C.V.S., of Appleby, Westmorland, a daughter, both well.

Omand.—On May 16th, 1948, at 43, Rosehill Drive, Aberdeen, to Nellie, wife of James Omand, B.Sc., M.R.C.V.S., a son.

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Marriage.—Gush—Russell.—On May 7th, 1948, in London, Flight-Lieutenant Peter Gush to Ann Frances Russell, M.R.C.V.S.

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ANIMAL HEALTH TRUST COUNTY MEETINGS

The campaign of the Animal Health Trust for enlisting support in the counties includes the holding of a number of meetings, both of a preliminary nature and to inaugurate County Committees.

One such meeting was held at Truro on May 19th, when a Committee was inaugurated for Cornwall, with the following Officers: *President.*—Sir John Molesworth St. Aubyn, Bart.; *Chairman.*—B. W. Knuckey, Esq.; *Hon. Secretary.*—Robert S. Townson, Esq., M.R.C.V.S.

Further meetings are announced as under:—

June 1st. *Newcastle-on-Tyne.*—Preliminary meeting. Speakers: Professor W. C. Miller, M.R.C.V.S., F.R.S.E., and Sir Cleveland Fyfe, C.B.E.

June 12th. *Reading.*—At 3 p.m. in the Small Hall of Agriculture House, 121, Oxford Road, Reading. To inaugurate Committee for Berkshire. Speaker: Sir Cleveland Fyfe, C.B.E. The following have agreed to serve as Office-bearers: *President.*—H. A. Benyon, Esq., J.P.: *Chairman.*—W. J. Cumber, Esq., C.B.E.; *Hon. Secretary.*—Colonel B. R. Body, M.R.C.V.S.

June 21st. *Winchester.*—At 3 p.m. in the Guildhall, Winchester. To inaugurate Committee for Hampshire. Speaker: Dr. W. R. Wooldridge, M.Sc., M.R.C.V.S. The following have agreed to serve as Office-bearers: *President.*—The Rt. Hon. Viscount Portal, P.C., D.S.O., M.V.O.: *Chairman.*—Sir Reginald Dorman-Smith, G.B.E.: *Hon. Secretary.*—R. C. Honey, Esq.

JUNE 30TH. *Maidstone.*—At 3 p.m. in Prince's Hall, The Royal Star Hotel, Maidstone. To inaugurate a Committee for Kent. Speaker: Sir Cleveland Fyfe, C.B.E. The following have agreed to serve as Office-bearers: *President.*—The Rt. Hon. Lord Mildmay of Flete; *Chairman.*—R. S. Thomson, Esq.; *Hon. Secretary.*—A. J. Beeson, Esq., M.R.C.V.S.

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On July 11th, at 8.25 p.m., there will be a "Week's Good Cause" appeal on the wireless on behalf of the funds of the Trust.

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SIR JOHN BOYD ORR ON NEED FOR WORLD FOOD PLAN

A widely representative conference has recently been held in Paris by the International Federation of Agricultural Producers under the able chairmanship of Mr. James Turner, President of our National Farmers' Union.

In his address to the conference on May 13th, Sir John Boyd Orr, director-general of the Food and Agriculture Organisation, gave farmers a rousing call to increase production. He said that the F.A.O. had in the gravest terms drawn the attention of Governments to the world position. If there were a good harvest in Europe and elsewhere this year the world food shortage would still continue. There were many more people in the world and they were demanding better food. In the United States, with full employment and good wages, food consumption had risen by 15 per cent., and wherever people now enjoyed a higher standard of living they would not go back without serious unrest. In the East people were no longer content to take conditions as an act of God. Millions would not die quietly.

In spite of all the difficulties the F.A.O. must persuade the nations to collaborate in a world food plan, Sir John Boyd Orr said. The World Food Council, under the chairmanship of Lord Bruce, was meeting with some success in getting the nations to put forward their proposals and state their needs in equipment for increased food production. The wheat agreement was a step in the right direction, but farmers really needed the assurance of markets for 20 years ahead. He looked forward to effective co-operation between the F.A.O. and the I.F.A.P., representing the farmers of the world, so that between them they could sponsor a world food plan for prosperity and peace.

* * * * *

LEGAL NOTES

Malicious Injury to Cattle.—At Dungarvon Circuit Court, on May 5th, Judge Roe heard an application under the Malicious Injury to Property Act for compensation for eight cattle, brought by Mrs. Mary Butler and her son, Patrick, farmers, Kilclooney, Kilmacthomas, against the Waterford County Council.

Mr. J. D'Arcy (for the applicant) outlined the circumstances which led the applicant's son and an employee to suspect malicious injury and consequently to send for the Guards and veterinary surgeons.

Dr. L. N. Gleeson, M.R.C.V.S., said he examined six cows at Mrs. Butler's farm and performed a *post-mortem* examination on one of them. The cows appeared to be in pain; they were straining, and there was evidence of interference with the genital passage. Witness found evidence of laceration. The *post-mortem* findings included peritonitis. He found a splinter of wood at the end of the bladder, which he removed, placed in an envelope, and sent to the Guards.

Continuing, Dr. Gleeson said it was quite easy to trace how the splinter had entered the body of the cow. Witness concluded that the wound inflicted had ruptured the bladder, causing acute peritonitis and shock. On April 10th, witness with a professional colleague carried out another *post-mortem* examination and their findings showed that an instrument had injured the bowel. There were three lacerations, each of them of such a nature as to lead him to believe that the same instrument or one of the same size had been used. Witness concluded that death was due to peritonitis and septicaemia, caused by a wound inflicted from outside. He also found a small section of wood which had penetrated the abdominal cavity. Witness with his colleague also examined the other cows and took all steps to mitigate peritonitis in the cows.

Cross-examined by Mr. M. M. Halley (for the Waterford County Council) Dr. Gleeson said that death from natural causes did not come into the picture at all.

To the court, witness said he did not think that the object of interfering with the cows was to cause abortion.

Supporting evidence having been given by other veterinary surgeons, His Lordship said he was satisfied that there was a malicious injury claim against the County Council. It was a shocking and outrageous type of crime, and he hoped that it was not very common in that county. There was no question but it was malicious injury and that the plaintiffs were entitled to compensation. He gave a decree for £267 and costs.

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

SWINE FEVER:

Staffs.—The Bungalow, High Orm, Church Eaton, Stafford (May 20th).

* * * * *

L.M.R. Carthorse Successes.—Of the 61 van horses entered by the London Midland Region of British Railways in the London Carthorse Parade held in Regent's Park on Whit-Monday, as recorded in our last issue, 60 won first prizes and one was awarded a second prize.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents are requested to write as briefly as possible

"AN OUTBREAK OF BRONCHITIS (INFECTIOUS RESPIRATORY CATARRH) IN HORSES"

Sir,—While congratulating L. E. Prichard on his short but orderly paper entitled as above, and while appreciating the careful work that he must have put into it, with tables and references, it cannot but be regretted that so long a period has elapsed since the actual outbreak swept the country, as with the passing months the memory becomes dimmed as to the finer points, when owing to the exigencies of practice, notes, so essential in theory, and so rare in actuality, were not made at the time.

However, there are one or two points that I should like to take up with the writer, the discussion of which may throw some further light on this epidemic.

In the first place, I would question the use of the term bronchitis, that is unless the epidemic had changed its character by the time it had reached Lancashire; here in the Midlands, it was characterised by a severe laryngitis, and with the exception of the ensuing catarrh (nasal) by nothing else. In fact, in spite of banner headlines in the popular Press, I feel certain that it was an epidemic analogous to the common cold in the human, that scourge of humanity which still causes the medical profession considerable embarrassment.

The affected horse showed a severe throat cough, difficulty in swallowing dry food, a slight rise in temperature, and a sluggish pulse; this was quickly followed by nasal catarrh, often from both nostrils. In some cases where animals were taken out to work early in the morning, this catarrh was the first symptom appreciated.

It became the routine to isolate such horses from the unaffected ones, to put them on a light and damped diet, and administer a mild febrifuge in their feed. In most cases mustard was applied externally to the region of the larynx, and an electuary was given on a bandaged bit, for the horse to suck. Apart from this, warm clothing, rugs and hoods were issued, and plenty of fresh air was the order of the day. Dry dusty bedding, and hay was excluded.

In only three instances, railway, brewery and tradesmen's studs included, were there cases of pneumonia, and each of these recovered after administration of sulphanilamide in a loading dose of three ounces, followed by one and a half ounces every eight hours, for a matter of three or four days.

In regard to purpura haemorrhagica, the total number of cases was eight, seven of which died or were destroyed, and these were all from two stables where horses were put back to work prematurely. The one horse that recovered (G.W.R.) received hourly doses of adrenalin subcutaneously, but as this treatment had no effect in the other seven cases little importance can be attached thereto.

Personally I consider that in most cases of the epidemic the animals recovered with the aid of careful hygiene, suitable feeding, and good nursing, rather in spite of, than because of any medicinal treatment.

In passing I would like Mr. Prichard's honest opinion as to the value of rubbing a horse's chest with liniment, as when one considers the area involved, and the depth of tissues concerned (coat, skin, subcutaneous fascia, thoracic skeleton, costal muscles, and pleura, I think that a liniment, unless it blisters, which Heaven forbid, is very far from effective.

His note on sulphanilamide and its inadequacy should be appre-

ciated as I do not think that he should have expected this drug to have any effect in the condition he mentions; in fact its use at such an early stage might prejudice the recovery should pneumonia follow; whereas I found that in those cases where the temperature rose to 104° or higher, its exhibition was almost a specific.

In his Discussion Mr. Prichard enumerates a list of diseases which the condition could not have been, amongst them contagious pneumonia (Brustseuche), equine influenza, and strangles. As far as this area was concerned these possibilities were never considered, though in four cases, three (G.W.R.) it was necessary to carry out tracheotomy to relieve breathing, and in one case (L.M.S.) a strangles cloth was used to reduce a throat swelling. In each of these cases it may well have been a localised lymphoedema that was causing the trouble as no abscesses were found.

Mr. Prichard argues in his Summary that Group C streptococcus may have been a causal factor in the epidemic. I should have been surprised, however, if he had not found one or more of the Streptococcal Groups represented, but as secondary invaders, not as primary agents.

Casting back in memory, the more one thinks about it the more one is convinced that the analogy of the common cold is nearer the mark than a bronchitis would be, and it would be interesting if a precise name could be found that could be appropriately applied.

In conclusion, I hope that the original paper, and this further letter, may evoke some interesting information, which may add to the knowledge of us all, especially of those who still have the remnants of that more specious age epitomised in the words Horse Practice.

Yours faithfully,

78, Broad Street, F. B. HARDY, M.R.C.V.S.
Birmingham, 15.
May 9th, 1948.

* * * * *

"SOME FURTHER OBSERVATIONS ON THE USE OF PENICILLIN IN CANINE LEPTOSPIROSIS"

Sir,—The letter from Misses Freak and Joshua is I feel a timely corrective on this subject. As a result of my experience with *L. icterohaemorrhagic* infection I have regarded earlier exaggerated claims for penicillin in this disease with, what might not inaptly be termed, a jaundiced eye. I am interested in the variations of the disease described but confine my observations to the naturally occurring icteric form which I meet with relatively often among sheep dogs. In these cases it is fair to say the disease has always been some days advanced and the temperature 100° F. or 99° F. with inappetence and depression marked, before advice and diagnosis were sought by the owner.

Three-hourly injections of penicillin carried out over a period—the quantity and the extent being increased experientially—led to *no* justification in the belief that the drug was materially affecting the fatal termination of the disease.

Yours faithfully,

Parkstone, JOHN F. BRADLEY, M.R.C.V.S.
Dorset.
May 23rd, 1948.

* * * * *

CASES OF "DICKKOPF" IN FOXES *

Sir,—In this country we encounter in foxes a disease which in Germany is designated "Dickkopf." Its appearance is generally considered to coincide with the eruption of the permanent teeth. Bacteriologically ordinary wound-microbes, streptococci, etc., are found. The heads of the affected animals are swollen.

I have seen this picture for several years, and I wish to describe an outbreak among a lot of foxes, which in many respects is peculiar.

On the fox farm were 350 blue foxes—80 grown-up and 270 pups; 40 silver foxes of which 30 were pups and 150 minks. None of the minks was affected.

The reason for the sickness was found to be a horse carcase used for fox-food. This horse had been injured by a thrust into the thigh from a mining bolt. A large swelling resulted, the horse dying on August 13th. It was thereafter skinned and the flesh fed to foxes, but the injured thigh was not used.

Illness amongst the foxes began on August 16th, and I was called in on the 18th. At the time of my first arrival six animals had died and 17 were seized with illness.

The bad meat had mostly been used for blue-fox pups, as experience has shown that they can stand somewhat poorer food than silver foxes. The blue foxes had had four meals, the silver foxes only one.

In all, 35 blue foxes were affected; of these, seven recovered. Two silver foxes became ill and both of them died. The affected animals were all whelps. The percentage is thus 12·9 per cent. blue foxes and 6·6 per cent. silver foxes.

Symptoms.—There was much swelling of the head, followed by a pronounced oedema, spreading down the neck and between the fore-feet, giving a lion-like appearance. The appetite was, however, remarkably good, until cessation of eating shortly before death. There was a little catarrh in the eyes of some of them on account of the oedema. None of the affected animals had diarrhoea, neither was there any sign of jaundice.

The animals were changing their teeth; on some of the foxes wounds could be seen on this account, but not on all. Small wounds might have been present nevertheless.

Apart from the presence of a few air-blisters in the oedematous areas, few changes were found. There was a little haemorrhagic fluid in the cavity of the chest and within the pericardium. The mucous membranes of the stomach and small intestine were partially affected.

Treatment.—The bad meat had already been taken away and sulphathiazole and penicillin were tried. I used 50,000 units penicillin twice a day for two days; also sulphathiazole, 0·5, four times a day for two days.

	Number	Died	Recovered
Treated with Penicillin	15	8	7
Treated with Sulphathiazole ...	5	5	0
Untreated	17	17	0

Treatment with penicillin seems thus to be of some value. Some of the animals were lightly attacked, but two of those that recovered were very ill. One very sick one with a marked "lion-face" received 100,000 units and was taken to Stavanger to be photographed. It died, however, before arrival in town, when little of the "lion-face" remained.

Bacteriological investigation was carried out on the dead foxes. Cultures were laid from the oedema and from organs, but all were sterile. An anaerobe culture was laid, but was unfortunately destroyed.

The bad horse-flesh that had been used was given blue-foxes in the Medical Clinic of the Veterinary High-School, but proved negative. Outer conditions may have been somewhat different in a fox farm with more sun-heat. Anaerobic bacteria were proved to be present in the horse-flesh. One cannot say that the cause of the illness is quite clear: as far as could be judged it was not an ordinary wound-infection.

Anaerobic infection occurs to one because of the presence of a few air-blisters in the oedema, but there were not many of them; also the fact that penicillin seemed effective.

Some things, however, might point to an ordinary allergical case, perhaps a histamin-effect. It is certain that the latter arose in connection with the horse-flesh mentioned.

The very malignant and violent course of the illness is remarkable. In dogs when the ears have been cut I have seen mild cases of "Dickkopf," and one may also see urticaria in the head as well as in other situations in the body. The latter, however, are of short duration and have been treated with purgatives.

These cases are certainly of an alimentary allergical nature.

The horse was a ten-year old, quiet one, that had been standing bound to a mining-bolt on pasture in the night, and was found injured in the morning. It had very probably been frightened by a horse-fly. It was in the middle of the horse-fly zone, and this fly mostly attacks in the morning. The injury is typical of what horse-flies can cause.

Fly-panic in Horses.—In connection with the above I wish to say a few words in regard to fly-panic in horses. These cases are apt to be misunderstood both by veterinarians and farmers. We have in this country only one kind of horse-fly, *Gastrophilus equi*. Its real swarming season is during late summer, at the end of July and later on, and this species can also be very active in October in this part of the country. It seems to prefer dark horses, as more eggs are found on these, but light horses may also have some. The insect flies rather quietly at the time of the laying of eggs; it is not disturbed by people and during flight may be beaten down with a cap.

It can attack during different times of the day, but some of the panic-cases I have seen have happened in the early morning. The quiet, well-mannered horse may under the influence of such panic go completely mad and throw itself on the bolt to which

* This communication constitutes the substance of an article contributed by our correspondent to a Norwegian periodical on the subject of gastric oedema, the writer being stimulated to submit it to us on reading of the similar condition in pigs referred to in the discussion by the Lincolnshire and District Division of the paper by Mr. H. C. Swann, "The Investigation of Disease in Swine" (*Vet. Rec. 60*, 165-168).—EDITOR.

it is tethered, jump along and get injured on barbed wire, etc. Sometimes it seems to seek water.

In this part of the country it is quite usual to tie horses to a bolt or a crowbar, and numerous accidents take place every year despite the fact that such a method of tethering is considered rather careless. The use of a soil-screw or a tree-peg with a ring is to be preferred.

Yours faithfully,

Stavanger, Norway. F. V. Holmboe, *District Veterinarian.*

April 19th, 1948.

* * * * *

THE VETERINARY SURGEONS BILL

Sir,—One cannot read the recent issues of *The Veterinary Record* or even reports of discussions which have taken place recently in the Palace of Westminster without experiencing a feeling of great sadness and shame. Sadness, for we see the end of a democratic institution and shame because our leaders have apparently succumbed to intimidation. Although on a minor scale, this is typical of the modern method of attaining an end. We have seen similar methods practised successfully in certain continental countries.

Our representatives must be quite unaware of the intense reaction within the profession to the suggestion to allocate to unqualified people the title "Veterinary Practitioner."

It may be that, as all negotiations have been conducted behind closed doors, they, our representatives, were not in touch with their constituents. If that be so, why was the profession not consulted? A referendum is one obivous method, another is that council men should resign and then making known how they stand, submit to the hazards of another election.

Either method would be equally efficacious.

Yours truly,

Royal Veterinary College and Hospital, Camden Town, London, N.W.1. J. McCunn.

May 18th, 1948.

. . . . .

Sir,—Whatever may be the final outcome, I am satisfied that I was right—and for the reasons so succinctly stated by my old friend and colleague, Leslie Pugh, in his Election Address—in voting against the resolution, which surrendered without so much as a skirmish, the word which inspired our forbears in 1844 to secure the first Royal Charter of Incorporation.

Doubtless there are not a few who will consider that the 16 who thought otherwise, were more far-seeing than those of us numbered amongst the nine, but surely they must agree that the whole profession should have been advised beforehand of the trend of affairs, and at least have obtained an inkling of its reaction. To talk about doing so now, is futile. The deed is done. Save for being unable to put any letters after his name, the charlatan is at once given all the benefits enjoyed by us, after much toil and sweat.

I will conclude with these well-known lines, as these seem so apt to quote:—

"Who steals my purse steals trash; 'tis something, nothing;
'Twas mine, 'tis his, and has been slave to thousands;
But he that filches from me my good name
Robs me of that which not enriches him,
And makes me poor indeed."

Yours faithfully,

"Rothiemurchus," St. Cross, Winchester. J. F. D. Tutt.

May 15th, 1948.

. . . . .

Sir,—I am sorry to see that the Royal College of Veterinary Surgeons has now gone into the black market, and that veterinary surgeons, according to the latest pamphlet, are in the future apparently to be hidden under the counter.

Is being a member of the R.C.V.S. something to be hidden? One would have thought it was something to be proud of, and that the R.C.V.S. would have done its best to let the public know that it possessed members, and that these members had the R.C.V.S. behind them.

Has this august body protected them when it allowed unqualified persons to masquerade under the title of "Veterinary Practitioner"?

Why should not a member be still permitted to use the arms of the R.C.V.S. on his notepaper? Is this something to be ashamed of?

Why should not a member still be allowed to put one advertisement in the local paper when he first commences to practise?

Is he to die of starvation before his first client comes along, consoling himself on his death-bed that he, at any rate, knows himself to be a veterinary surgeon, but no one else does.

Is a member to hide his light under a bushel, and practise his profession in a cave, while the unqualified are put on a Register and boosted by our own Council?

Why have we got to be so "damned coy"?

Yours faithfully,

48, Baker Street, Potters Bar, Middlesex. J. M. Macqueen.

May 18th, 1948.

. . . . .

Sir,—Apparently Council R.C.V.S., labours under the misapprehension that the Veterinary Surgeons Bill is likely to prove of benefit to the profession. Why they should so delude themselves must rank as one of the great unsolved mysteries of our time. No person with any gumption believes for one moment that the Bill will eliminate quackery.

What it will do is to create a higher strata of quacks, who will, upon payment of one guinea, receive the valued and hitherto jealously guarded title of "Veterinary Practitioner." It will also serve to confuse further an already bewildered lay public and may even result in that lay public coming to regard the veterinary practitioner as a man of higher standing than the qualified veterinary surgeon. Meantime the remaining quacks who either fail to qualify for this title or who prefer to remain without the scope of the Bill, may, so long as they refrain from using either the title "Veterinary Surgeon" or "Veterinary Practitioner," continue to quack to their heart's content. Nor are those animal welfare societies who employ unqualified staff likely to alter their ways.

It appears to me that in withdrawing their opposition to the granting of the title of "Veterinary Practitioner" to quacks, the members of Council have acted in their usual weak-kneed fashion and that they have performed a grave disservice to members of the profession everywhere. I would suggest that an immediate plebiscite be taken to ascertain the views of all members of the profession regarding this handing over of a much-cherished title to a motley collection of quacks and that a firm stand be made against it. What does it matter if the progress of the Bill through Parliament is delayed? It stinks anyhow and I fail to see why we as a profession should be brow-beaten and dictated to in a matter as vitally important as this!

Over a period of years the profession has waged a grim struggle for improved recognition and now, just when we are beginning to reap the reward of that struggle, all we have fought for is on the point of being wrested from our grasp by the shilly-shallying weak-kneed attitude of men elected to safeguard our interests. There can be no excuse for such servility and I, for one, wish to express the strongest disapproval of their action. I only hope that there are others who feel as I do and that they will take steps to voice their disapproval.

Yours faithfully,

Moss House, Scotland Lane, Horsforth, Leeds. F. J. Kinghorn.

May 18th, 1948.

. . . . .

Sir,—Already the advertising department allows the use of your columns for what is termed an extract from a "Diary of a Veterinary Practitioner" (Page viii, *V.R.* May 15th). Does this mean an M.R.C.V.S.—for a Veterinary Practitioner, according to law, does not exist yet?

Will an M.R.C.V.S. be allowed to designate himself as A.N. Other, Veterinary Surgeon and Practitioner? The public (as the advertiser, it seems) will consider that the practitioner is for general work and the surgeon for "cutting."

This clause should be bitterly opposed, for the trend of increased knowledge and education of the public will surely in time demand the qualified man and quackery will then die a natural death.

I know a married lady whose father, grandfather and uncle are/were veterinary surgeons and brother a veterinary student, who yet employs a quack—because "he's nice"! Will the Bill stop this?

Yours faithfully,

The Surgery, 48, Hornchurch Road, Romford. Sidney S. Nye.

May 20th, 1948.

JEWISH AND MOHAMMEDAN METHODS OF SLAUGHTER

Sir,—Your correspondence columns of the 24th ultimo carry a letter from Mr. H. E. Bywater, Chief Veterinary Officer of West Ham. The letter opens with the all-too-conciliatory terms: "This is not intended as an appeal to sentiment. It is an appeal to reason, presented with little comment and based upon the cold logic of incontrovertible facts." This opening is, alas, only the spider's web intended to enmesh the unwary. The logic of "his" incontrovertible facts has long since not only been controverted but annihilated.

The statement in the next paragraph is a good instance of Mr. Bywater's "incontrovertible facts." Compendiously describing the Jewish method of slaughter, he proceeds to say that "the animal is allowed to bleed to death while fully conscious." This statement has been met and disposed of time and time again.

In 1923 Sir William Bayliss, D.Sc., LL.D., F.R.S., Professor of General Physiology, at University College, London, in his report on the Jewish method of slaughter of animals for food declared: "The description of the method as 'bleeding the animal to death' is in my opinion unfair. It omits to express the fact that the bleeding animal is throughout incapable of sensation, and that the bleeding is very rapid."

Professor T. B. Wood, C.B.E., M.A., F.R.S., Draper's Professor of Agriculture, University of Cambridge; Professor James Barcroft, C.B.E., M.A., F.R.S., Reader in Physiology at Cambridge University; L. F. Newman, M.A., Director of Agriculture, University of Cambridge, in their report on the subject declared: "The control of the eye muscles is lost in about ten seconds. The salient feature of the Jewish method is that the fall of blood pressure is so rapid that sensation can only persist for a fraction of that time." T. H. Openshaw, M.D., M.A., F.R.C.S., the famous London surgeon, in a report on the same subject, declares that "as the result of the sudden division of both carotids a sudden profound cerebral anaemia immediately results which prevents the animal feeling pain. Consciousness is rapidly dulled and soon lost. I am absolutely in accord with a statement by Lord Lister 'that to charge the Jews with cruelty in this matter, *i.e.*, the killing of animals, is grossly unjust'."

And finally exhaustive tests applied by a number of specialists in physiology, surgery and veterinary surgery contained in reports *which have been published* have established that this method of cutting produces immediate insensibility from which the animal does not recover.

Mr. Bywater further has to rely for proof of his allegation that the Jewish method of slaughter is inhumane on a report which was made more than 45 years ago by the late Sir Michael Foster, F.R.S., and the late Professor Starling, F.R.S. What Mr. Bywater omits is the fact that the accuracy of this report was at once attacked, and in no uncertain language, by Professor Leonard Hill, M.D., F.R.S., and by Mr. T. P. Openshaw supported by Professor Owen Williams, the President of the Royal College of Veterinary Surgeons, and their direct challenge was never taken up by Professor Foster or Professor Starling. It is doubtful whether in the history of science there will be found another instance of well-known scientists allowing their accuracy to be impugned in a widely circulated publication, and sitting down under it. The inference is inescapable. Their report was definitely incorrect. The challenge was actually repeated by—among others—Professor Sir William Bayliss, who had no hesitation in stating that the Jewish method was absolutely humane, although this meant a definite attack on the report of Professor Starling, who was not only a close, intimate friend and a co-worker, but was also a near connection by marriage, and if further confirmation of the humanity of the Jewish method were necessary, it can be found in the statement of Professor Lovatt Evans who, having witnessed the Jewish method in operation at the abattoir at Leeds, wrote "I should be happy to think that my own end were likely to be as swift and painless as the end of these cattle killed in this—Jewish—way undoubtedly is."

I have before me as I write the recently published report of a Committee appointed by the Society of Prevention of Cruelty to Animals to enquire into the conditions at the Salisbury (S. Rhodesia) Abattoir appertaining to the slaughter of animals for human consumption. The personnel of the Committee was, amongst others, as follows:—

Andrew Paton Martin, Esq., O.B.E., M.D., D.P.H., D.T.M. & H., L. E. W. Bevan, Esq., M.R.C.V.S., A. W. Redfern, Esq., O.B.E., and I. R. Rosin, Esq., M.A., M.D., F.R.C.S.

I should say the interest in this report arises from the fact that the committee enquired not only into the Jewish method of slaughter, but also engaged in an investigation comparing the Jewish preparatory method with the method of electrical stunning. The Committee reported that "in the Kosher method loss of consciousness was instantaneous and death followed almost immediately upon the cutting of the throat; in the other method where preparatory electric stunning was used it was apparent that the animal was conscious for some seconds while the current was being applied, and it was difficult to say whether during that period any pain was being experienced or not. In the view of the Committee there was nothing to choose between the methods, and the Jewish method was at least as humane as that of the preliminary electric stunning."

Mr. Bywater further tells your readers "searching enquiries among Jewish authorities fail to show any religious obligations for carrying on existing methods of slaughter. The Mosaic Law enjoined no such formalities. Apparently they are based on certain passages in the Talmud, and are merely a matter of ritual custom." I must acknowledge that I find it difficult to discover any cold logic or incontrovertible facts in these sentences. What competent Jewish authorities did Mr. Bywater consult? And in truth the passages in the Talmud to which Mr. Bywater refers are the legal interpretations of Mosaic Ordinances: the incontrovertible fact is that the Jewish method goes back to Mosaic times, and Mr. Bywater will not impugn the authority that declared "sooner shall the whole world pass away than a jot or tittle of the law of Moses" (Mat. 5. 18). This being so it is not surprising "to find Jews clinging obstinately to a practice" which hundreds of scientists of world-wide reputation have declared, on every investigation to be humane: and is in the tradition of the people who first taught the world "the righteous man knows the spirit of his beast." "Thou shall not muzzle the ox when he treadeth out the corn." "When thou seest the ass of thy neighbour heavily laden thou shall surely ease his burden." And finally, who ordained the observance of the Sabbath Day in order that the beast should have rest?

One matter I share fully with Mr. Bywater, and that is regret that conditions in some slaughter-houses as a result of the war have made it impossible by reason of the want of space to maintain the Weinberg Casting Pen in every place where the Jewish method is practised. There are many pens laid up and rotting by reason of this fact. But in all such cases mattresses are enjoined and used. This, of course, applies only to very small communities, and the communities concerned are eagerly awaiting the day when the relaxation of present-day restrictions will enable them to re-install the Weinberg Pen in every instance, and it is hoped in suitable public abattoirs. The larger Jewish communities in this country, *e.g.*, London, Liverpool, Birkenhead, Glasgow, Newcastle, Sheffield, have Weinberg Pens operating for the specific purpose of the Jewish method, and visitors who have come to view the method in practice have expressed their complete appreciation of the humane treatment observed; thus the late Sir Frederick Hobday, President of the Royal Veterinary College, expressed his view that "the Jewish method was the most humane in the world."

Yours faithfully,

Woburn House,
Upper Woburn Place,
London, W.C.1.
May 7th, 1948.

Elsley Zeitlyn,
Chairman, Shechita Committee,
Board of Deputies of British Jews.

. . . . . .

Sir,—I thank you for your courtesy in allowing me to reply to the letter of Mr. Elsley Zeitlyn, who has referred to my comments as "the spider's web to enmesh the unwary." This description best fits his tactics, for some of the statements upon which he bases his case are incorrect. I will endeavour to adhere to the "cold logic of the incontrovertible facts," in my reply to the points he has raised. That "the animal is allowed to bleed to death while fully conscious" is scientifically correct. I did not state that consciousness persists until death has ensued. Death can never be instantaneous, it is a gradual process. Evidence has been produced by the Jews from time to time, in an attempt to prove the absence of pain following the actual severance of the throat, but it has always been received with scepticism by certain humanitarians who have yet to be convinced that criticisms have "been met and disposed of time and time again." The South Rhodesia S.P.C.A. report, if correctly quoted by Mr. Zeitlyn and if it were unqualified, in stating that loss of consciousness was *instantaneous* is open to question.

My opinion is based mainly on my own observations and although I acknowledge the high authorities who have spoken in favour of the Jewish method of slaughtering I do not necessarily consider that they are the most competent to give a scientific opinion on such matters. Admittedly consciousness, as measured by time, is of short duration, but time may "drag" considerably under mental stress. I remember being thrown from a horse and whilst "gliding through the air with the greatest of ease" I saw I must strike a tree unless I moved my shoulders and head, which fortunately—for me—I was able to do. The time was merely a few seconds and the movement not without some impetus. The nervous reaction

was remarkably prolonged. Seemingly, I thought very slowly and acted without haste; all appeared very leisurely indeed. Fear and pain in man cannot be measured in seconds and then summarily dismissed as negligible. We know little of similar nervous reactions in animals and until we know more we must assume—in all justice and humanity—that they are not dissimilar to those in man, of which alone we have reliable evidence.

I am not unacquainted with the reports which have been issued since the Admiralty Report which, as far as I am aware, is the only record of a Government enquiry into the Jewish method of slaughter. It was specifically mentioned to show that grave doubts as to the humanity of this method were raised officially nearly half a century ago, yet the position, in general, has improved but little and has actually deteriorated since the Ministry of Food acquired a monopoly in the slaughter of food animals the flesh of which constitutes rationed meat. The blame is not entirely that of the Jews; the Ministry of Food and their slaughtering contractors are not exempt from criticism and must take blame, with the Jews, for sins of omission and commission.

As I pointed out in my letter, "much that is objectionable in their present practice could be removed if Jewish authorities would take advantage of improved methods of casting." Indeed it is the preliminary casting and positioning, occupying several minutes, whilst the animal is fully conscious, that is the most objectionable part of the Jewish ritual, and this opinion is shared by most authorities on humane slaughtering and was by the late Sir Frederick Hobday with whom I visited the early demonstrations of the Weinberg Pen when he was Principal of the Royal Veterinary College and Hospital, not President of the Royal Veterinary College as stated by Mr. Zeitlyn. (Incidentally, to prevent any possible misunderstanding, Sir Frederick never held the office of President of the R.C.V.S.) Like him I warmly welcomed the invention of the Weinberg Pen since its use removed much that is objectionable in the preparation of beasts destined for the Shochet's knife. Unfortunately at the time, there was some opposition by the Board of Deputies to this appliance which was accepted by them rather grudgingly—at least so Mr. Weinberg personally informed us: attributing this, correctly or incorrectly, to the fact that he was by trade a tailor and, therefore, considered unqualified to express opinions on slaughtering.

The statement that these pens are laid by *owing to lack of space* may be true in some cases, but it is certainly not correct in all. The statement that where casting pens are not in use "in all such cases mattresses are enjoined and used" is unfortunately not accurate. I have before me particulars of the conditions, obtaining in January of this year, in the majority of slaughtering establishments in England where Jewish slaughter is practised.

In ten, the Weinberg or other casting pen was in use.

In 17, no such pen was used, but mattresses, matting or straw sacks, etc., were in use.

In one establishment mats were supplied but never used whilst in another mats were used only occasionally.

In 31 establishments neither pen, mattress nor material of any kind was used, the beasts being cast on to hard concrete floors. Fuller and more detailed particulars can be supplied if necessary.

Mr. Zeitlyn states that "the incontrovertible fact is that the Jewish method goes back to Mosaic times" and infers that it is part of the Mosaic Ordinances. I do not claim to be an authority on religion but I challenge Mr. Zeitlyn to quote any reference in the Mosaic law to the preparation of animals for slaughter. I was under the impression that the Mosaic law was laid down in the third book of Moses (which is usually known to Christians as Leviticus) and is also repeated with slight variation in other books of Moses such as the fifth book—which we call Deuteronomy. I am indebted to Mr. Zeitlyn for drawing my attention to the fifth chapter of Matthew which contains the "Sermon on the Mount" and the injunction "Blessed are the merciful." The same chapter speaks disparagingly of the Scribes and Pharisees, and directly repudiates certain of the Mosaic laws such as "an eye for an eye and a tooth for a tooth." The quotation given was very conveniently altered by Mr. Zeitlyn who has added after "the law" the words "of Moses." Such words do not appear in my Bible but perhaps Mr. Zeitlyn has a version of the Scriptures which is unknown to me. The bedrock of Christian belief is the Grace of God which was propounded by the life and teaching of Jesus Christ the Jew—to whose teachings much of the evolution of humanity towards man and beast is due. The Jews had a tradition for kindness to animals far in advance of other peoples; cannot they be persuaded to bring some of this traditional kindness more into line with the advancement which has taken place with the development of civilisation? In Deuteronomy (the fifth book of Moses) chapter 14, verse 21, the Jews are enjoined not to "eat of anything that dieth of itself: thou shalt give it unto the stranger that is within thy gates, that he may eat it; or thou mayest sell it unto an alien: for thou art an holy people unto the Lord thy God." Surely this is the Mosaic law, yet I hope no orthodox Jew would so violate the Public Health Acts of modern times as to sell obviously unsound food.

"Blessed are the merciful; for they shall obtain mercy."

Yours faithfully,

West Ham, E.15. H. E. Bywater.

. . . . . .

Sir,—May I congratulate Mr. Bywater on the extremely able manner in which (*The Record* of April 24th) he advocated the necessity for reform in slaughtering methods, and perhaps particularly in the methods employed by the Jews and Mohammedans. Why these unnecessary cruelties are permitted, as Bywater says, "in the year of grace 1948," in civilised communities is beyond comprehension.

The whole question of the slaughter of animals for food in Britain requires consideration. In some of the larger more modern abattoirs animals are despatched quickly and humanely, but in many slaughterhouses animals are still subject to a considerable amount of unnecessary cruelty. One of the main reasons is probably lack of adequate facilities. The first essential is the erection of proper stunning pens so that the poor animals are unaware of what is coming to them.

We can be confident that had the veterinary profession more say in the matter during the last 20 years or so, there would have been improvement in the methods of slaughter and less cruelty.

The responsibility now rests on the Ministry of Food, but one see little hope of early improvement in the evasive replies given when the subject is raised by people who are concerned; replies apparently prompted by a lack of appreciation of the real situation.

The profession has done useful work on abattoir administration and food inspection when given the opportunity. The authorities in Britain, however, as compared with those in practically all other civilised countries, have been slow to appreciate the scientific knowledge the trained veterinarian can bring to this work, and how this type of work can be a means of increasing our knowledge of pathology and disease.

Yours faithfully,

Alabama Polytechnic Institute, Auburn, Alabama. *May 10th, 1948.*

F. H. Manley,
Professor, Depts. Bacteriology and Pathology, School of Veterinary Medicine.

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THE CANINE NURSE

Sir,—I read with interest and a good deal of satisfaction, Miss Rachel Phillips' letter in your issue of May 22nd.

Nobody denies that good canine nurses exist and are worth their weight in gold to the busy practitioner, nor could Miss Phillips' picture of their duties be considered in any way overdrawn.

It is somewhat curious that canine nurses, as a body, have shown so little interest in establishing their chosen career as a profession and, have, so far, left all advances in this direction to the veterinary profession. It is at least fortunate for them that "dreamers" can also be practical and make reality of their imaginings. The real point at issue is the fact that there is no clear-cut definition of a canine nurse and the result is that, as Miss Phillips so truly says, no distinction is drawn between the little girl from the Labour Exchange and the girl who has undergone training and acquired such knowledge, skill and experience as to justify her claim to the title of nurse.

In this connection I should like to register my regret that Miss Phillips has turned her "sardonic smile" on the little girl from the Labour Exchange; some of our best nurses have originated from that source and it is quite true that no comparison is possible between the status of the canine and the human nurse, but I should like to point out that human nursing only received recognition as a profession when a definite standard of knowledge, skill and efficiency was set up by examinations, both written and practical. By this means, human nursing was lifted out of the "Sarah Gamp" state and set upon its present high plane and there is no reason why animal nursing should not follow this excellent example.

So far, the movement has been handicapped by the apathy shown by the animal nurses themselves and for this reason I welcome Miss Phillips' letter: it is the second flicker of interest shown by her profession on their own behalf, and though its forthrightness extends perhaps towards the ungracious, it is better than indifference.

Yours faithfully,

"A Dreamer."

N.V.M.A. CONGRESS, 1948

September 8th - 15th (inclusive)

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	Full Board	*Bed and Breakfast*
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Palace Hotel, Westcliffe Road, Birkdale	25/- to 35/-	—
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Queen's Hotel, Promenade, Southport	25/-	—
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Messrs. Hulley & Shufflebottom, 31, Leicester Street, Southport	17/6	12/6
Ivanhoe Private Hotel, 87, Avondale Road, Southport	15/6	—
Knowsley Private Hotel, 2, Knowsley Road, Southport	17/6	10/6
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Orleans Private Hotel, 8, Lathom Road, Southport	22/6	13/-
Queen's Gate Private Hotel, 49, Queen's Road, Southport	21/-	12/6
Russell Hotel, 56, Promenade, Southport	18/6	12/6
Stafford House, 18, Bank Square, Southport (Mrs. M. W. Howarth)	15/6	10/6
Stella Maris Private Hotel, 25, Promenade, Southport	18/6	12/6
Summerfield Private Hotel, 31, Leicester Street, Southport	17/6	12/6 Saturday to Saturday bookings only
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Tatley Private Hotel, 83, Manchester Road, Southport	17/6	12/6
Mr. H. Tyson, 39, Bath Street, Southport	15/-	10/6
Willow Bank Private Hotel, 117, Leyland Road, Southport	15/-	10/6 Saturday to Saturday bookings only

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